Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date : 30.07.2022

ATTERBERG LIMITS TEST FOR WMM

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri Yoganand B M** Contractor Bangalore

Name of Work : Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15

IS Code: : IS 2720(Part 5):1985

Date of Testing : 28.07.2022 to 30.07.2022

Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	20.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Assistant Executive Engineer
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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 30.07.2022

Aggregate Impact Value

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Sri Yoganand B M** Contractor Bangalore
Name of the Work	Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
IS Code	IS 2386 (Part 4):1963(RA 2011)
Type of Mix	Wet Mix macadam
Date of Testing	30.07.2022

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	295	295	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.37	22.77	**22.57**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%(As per MORTH Specication table 400.12)

Assistant Executive Engineer
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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date : 30.07.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**Sri Yoganand B M Contractor Bangalore**
Name of Work	Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
BIS code:	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	30.07.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 400.12
1	Flakiness Index %	11.60	11.90	Combined Flakiness & Elongation index Max 35%
2	Elongation Index %	13.10	13.50	
	Combined Flakiness & Elongation index	24.70	25.40	

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30/07/22

Assistant Executive Engineer
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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date : 30.07.2022

GRADATION FOR WMM

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri Yoganand B M** Contractor Bangalore

Name of Work : Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15

IS Code: : IS 2386 (Part 1):1963(RA 2011)

Date of Testing : 30.07.2022

Material Type : Wet Mix Macadam

Oven Dry.Wt, grams 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	165	165	1.7	98.4	95-100
22.4	2530	2695	27.0	73.1	60-80
11.2	2168	4863	48.6	51.4	40-60
4.75	1856	6719	67.2	32.8	25-40
2.36	1152	7871	78.7	21.3	15-30
0.600	526	8397	84.0	16.0	8-22
0.075	1236	9633	96.3	3.7	0-5

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Job No.: CACE/BBMP/YBM/W.No.15/2022-23 Date : 30.07.2022

GRADATION FOR WMM

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri Yoganand B M** Contractor Bangalore

Name of Work : Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15

IS Code: : IS 2386 (Part 1):1963(RA 2011)

Date of Testing : 30.07.2022

Material Type : Wet Mix Macadam

Oven Dry.Wt, grams 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	175	175	1.8	98.3	95-100
22.4	2536	2711	27.1	72.9	60-80
11.2	2160	4871	48.7	51.3	40-60
4.75	1865	6736	67.4	32.6	25-40
2.36	1152	7888	78.9	21.1	15-30
0.600	589	8477	84.8	15.2	8-22
0.075	1210	9687	96.9	3.1	0-5

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JobNo: CACE/BBMP/YBM/W No.15/2022-23 Date : 13.08.2022

TEST RESULTS OF AGGREGATE SHAPE TEST
(Flakiness & Elongation)

Client : Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.

Agency : Sri Yoganand B M Contractor Bangalore

Name of work : Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15

BIS Code : IS 2386 Part (1):1963

Date of Test : 13.08.2022

Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	12.20	13.60	25.80	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	12.60	13.90	26.50	

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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 13.08.2022

Aggregate Gradation Test

Client	**: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri Yoganand B M Contractor Bangalore**
Name of the Work	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
BIS Code	IS 2386(Part 1):1963(RA 2011)
Sample I / D	Hot mix Plant, Bangalore.
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	13.08.2022

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	715	7.2	7.15	92.85	90 - 100	
19.00	1265	12.7	19.80	80.20	71 - 95	
13.20	1385	13.9	33.65	66.35	56 - 80	
4.75	2514	25.1	58.79	41.21	38 - 54	
2.36	1097	11.0	69.76	30.24	28 - 42	
0.300	1319	13.2	82.95	17.05	7 - 21	
0.075	1156	11.6	94.51	5.49	2 - 8	

Total Weight of Sample: **10000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	685	6.9	6.85	93.15	90 - 100	
19	1415	14.2	21.00	79.00	71 - 95	
13.2	1136	11.4	32.36	67.64	56 - 80	
4.75	2415	24.2	56.51	43.49	38 - 54	
2.360	1159	11.6	68.10	31.90	28 - 42	
0.300	1312	13.1	81.22	18.78	7 - 21	
0.075	1174	11.7	92.96	7.04	2 - 8	

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JobNo: CACE/BBMP/YBM/W No.15/2022-23 Date : 13.08.2022

TEST RESULTS OF AGGREGATE IMPACT VALUE

Client : Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.

Agency : Sri Yoganand B M Contractor Bangalore

Name of work : Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15

Source / Location : Hot Mix Plant, Bangalore

BIS Code : IS 2386 Part (4):1963

Type of Mix : Dense Graded Bituminous Macadam

Date of test : 13.08.2022

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	383	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W2 g	87	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	296	296	
5	Aggregate Impact value = percent fines 100* (W2/W1) percent	22.72	23.12	22.92

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27% (Table 500-8 of MORTH specification)

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Job No: CACE/BBMP/YBM/W No.15/2022-23 Date: **13.08.2022**

TEST REPORT ON PAVING BITUMEN

Client	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: Sri Yoganand B M Contractor Bangalore
Name of work	": Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
BIS Code	IS 73:2013,IS 1203:1978, IS 1208:1978, IS 1205:1978, IS1448(P-69):1969
Date of Testing	**13.08.2022**
Type of Mix	**Dense Graded Bituminous Macadam , VG 30**
Source of Location	**Hot Mix Plant**

The results of the tests conducted on the bitumen sample using for Dense Graded Bituminous Macadam

Sl.No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 0C, 100gms, 5sec, 1/10 mm	52	Min 45
2	Softening point, 0C	50	Min 47
3	Ductility at 250C, cm	>100	Min40
4	Flash Point, 0C	282	Min 220

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Job No.: CACE/BBMP/YBM/W No.15/2022-23

Date: 13.08.2022

Specific Gravity And Water Absorption Test

Client	**: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri Yoganand B M Contractor Bangalore**
Name of the Work	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
BIS Code	IS 2386(Part 3):1963
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	11.08.2022 to 13.08.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2023	
2	Weight of basket suspended in water	W_2 g	756	756	756	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1264	1266	1267	
4	Weight of saturated surface dry aggregate in air	W_3 g	2017	2016	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	753	750	748	
6	Weight of oven dried aggregate	W_4 g	2007	2007	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.665	2.676	2.680	2.674
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.701	2.709	2.717	2.709
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.45%	0.50%	0.48%

Comments:

→ Maximum allowable Aggregate Water absorption value for Dense Graded Bituminous Macadam is 2.0%(As per MORTH table 500.8)

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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 18.08.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	:	**: Sri Yoganand B M Contractor Bangalore**
Name of the Work	:	": Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	18.08.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.26	10.06	9 Kn (min)
2	Marshal flow, mm	3.67	3.75	2 – 4
3	Percent air voids in Mineral Aggregate	13.77	14.30	13 – 15
4	Voids in Compacted Mix	3.80	4.22	3 – 6
5	Percent Voids filled with Bitumen	68.89	69.55	65 - 75
6	Density, g/cc	2.23	2.27	--

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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 18.08.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	:	**: Sri Yoganand B M** Contractor Bangalore
Name of the Work	:	": Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	18.08.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.25	10.12	9 Kn (min)
2	Marshal flow, mm	3.68	3.58	2 – 4
3	Percent air voids in Mineral Aggregate	13.79	14.35	13 – 15
4	Voids in Compacted Mix	3.84	4.26	3 – 6
5	Percent Voids filled with Bitumen	68.91	69.57	65 - 75
6	Density, g/cc	2.25	2.27	--

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BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	Sri Yoganand B M Contractor Bangalore
Name of the Work	Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Date of Testing	18.08.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.50	23.00
7. Bitumen content in %	4.50	4.60
8. Average	4.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	34.6	34.6	7.2	92.8	90 - 100
19	74.1	108.7	22.8	77.2	71 - 95
13.2	66.5	175.2	36.7	63.3	56 - 80
4.75	75	250.2	52.4	47.6	38 - 54
2.360	96.5	346.7	72.6	27.4	28 - 42
0.300	96.4	443.1	92.8	7.2	7 - 21
0.075	21.5	464.6	97.3	2.7	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.7	36.7	7.7	92.3	90 - 100
19	74.3	111	23.3	76.7	71 - 95
13.2	66.5	177.5	37.2	62.8	56 - 80
4.75	84.60	262.1	54.9	45.1	38 - 54
2.360	78.5	340.6	71.4	28.6	28 - 42
0.300	98.3	438.9	92.0	8.0	7 - 21
0.075	23.5	462.4	96.9	3.1	2 - 8

Assistant Executive Engineer
T. Dasarahalli Sub Division
Bagalagunte, BBMP
Bangalore-560073

For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 18.08.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

Client	**Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**Sri Yoganand B M Contractor Bangalore**
Name of the Work	Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Date of Testing	18.08.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.5	477.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.50	22.50
7. Bitumen content in %	4.50	4.50
8. Average	**4.50**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	35.2	35.2	7.4	92.6	90 - 100
19	74.1	109.3	22.9	77.1	71 - 95
13.2	66.2	175.5	36.8	63.2	56 - 80
4.75	84.9	260.4	54.5	45.5	38 - 54
2.360	76.2	336.6	70.5	29.5	28 - 42
0.300	96.9	433.5	90.8	9.2	7 - 21
0.075	22.3	455.8	95.5	4.5	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.8	36.8	7.7	92.3	90 - 100
19	73.5	110.3	23.1	76.9	71 - 95
13.2	67.8	178.1	37.3	62.7	56 - 80
4.75	84.80	262.9	55.1	44.9	38 - 54
2.360	78.5	341.4	71.5	28.5	28 - 42
0.300	98.6	440	92.1	7.9	7 - 21
0.075	29.4	469.4	98.3	1.7	2 - 8

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Assistant Executive Engineer
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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 16.08.2022

Aggregate Impact Value

Client	**: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri Yoganand B M Contractor Bangalore**
Name of the Work	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
BIS Code	IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.08.2022

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85.5	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297	297.5	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.05	22.32	**22.19**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/YBM/W No.15/2022-23

Date : 16.08.2022

Aggregate Gradation Test

IS : 2386 Part I

Client	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: Sri Yoganand B M Contractor Bangalore
Name of the Work	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
BIS Code	IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.08.2022

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	415	8.30	8.30	91.70	90 - 100	
9.5	482	9.64	17.94	82.06	70 - 88	
4.75	635	12.70	30.64	69.36	53 - 71	
2.36	682	13.64	44.28	55.72	42 - 58	
1.18	520	10.40	54.68	45.32	34 - 48	
0.600	546	10.92	65.60	34.40	26 - 38	
0.300	489	9.78	75.38	24.62	18 - 28	
0.150	366	7.32	82.70	17.30	12 - 20	
0.075	482	9.64	92.34	7.66	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	420	8.40	8.40	91.60	90 - 100	
9.5	549	10.98	19.38	80.62	70 - 88	
4.75	682	13.64	33.02	66.98	53 - 71	
2.36	533	10.66	43.68	56.32	42 - 58	
1.18	559	11.18	54.86	45.14	34 - 48	
0.600	546	10.92	65.78	34.22	26 - 38	
0.300	682	13.64	79.42	20.58	18 - 28	
0.150	198	3.96	83.38	16.62	12 - 20	
0.075	482	9.64	93.02	6.98	4 - 10	

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For CIVIL AIM CONSULTANTS & ENGINEERS

Srikanth

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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 16.08.2022

TEST REPORT

Client	:	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri Yoganand B M Contractor Bangalore
Name of the work	:	": Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	16.08.2022

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	48	Min 45
2	Softening point, ^{0}C	54	Min. 47
3	Ductility at 27^{0}C, cm	> 100	Min. 40
4	Flash Point, ^{0}C	272	Min. 220

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Job No.: CACE/BBMP/YBM/W No.15/2022-23

Date : 16.08.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri Yoganand B M Contractor Bangalore**
Name of Work	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	16.08.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.6	12.2	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	13.2	13.4	
	Combined Flakiness & Elongation index	24.80	25.60	

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Job No.: CACE/BBMP/YBM/W No.15/2022-23

Date : 18.08.2022

Specific Gravity And Water Absorption Test

Client	**: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri Yoganand B M Contractor Bangalore**
Name of the Work	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	16.08.2022 to 18.08.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2024	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1267	1269	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2018	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	751	751	
6	Weight of oven dried aggregate	W_4 g	2010	2011	2012	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.676	2.678	2.679	2.678
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.698	2.703	2.708	2.703
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.30%	0.35%	0.40%	0.35%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

Assistant Executive Engineer
Dasarahalli Sub Division
Bagalagunte, BBMP
Bangalore-560073

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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date: 20.08.2022

TEST REPORT ON STABILITY OF MIX

Client	:	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri Yoganand B M Contractor Bangalore
Name of the Work	:	": Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	20.08.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.25	9.58	9 Kn (min)
2	Marshal flow, mm	3.67	2.45	2 – 4
3	Percent air voids in Mineral Aggregate	13.46	14.52	13 – 15
4	Voids in Compacted Mix	3.78	4.61	3 – 6
5	Percent Voids filled with Bitumen	70.12	71.15	65 - 75
6	Density, g/cc	2.25	2.26	--

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Ref No.: CACE/BBMP/YBM/W No.05/2022-23 Date: 20.08.2022

TEST REPORT ON STABILITY OF MIX

Client	:	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri Yoganand B M Contractor Bangalore
Name of the Work	:	": Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	20.08.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.44	10.82	9 Kn (min)
2	Marshal flow, mm	2.69	2.65	2 – 4
3	Percent air voids in Mineral Aggregate	13.45	14.52	13 – 15
4	Voids in Compacted Mix	3.84	4.15	3 – 6
5	Percent Voids filled with Bitumen	69.29	70.12	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CACE/BBMP/YBM/W No.15/2022-23

Date: 22.08.2022

TEST REPORT ON STABILITY OF MIX

Client	:	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri Yoganand B M Contractor Bangalore
Name of the Work	:	": Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	22.08.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.49	10.87	9 Kn (min)
2	Marshal flow, mm	2.74	2.96	2 – 4
3	Percent air voids in Mineral Aggregate	13.50	14.57	13 – 15
4	Voids in Compacted Mix	3.89	4.20	3 – 6
5	Percent Voids filled with Bitumen	69.34	70.17	65 - 75
6	Density, g/cc	2.24	2.26	--

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Job No.: CACE/BBMP/YBM/W No.15/2022-23

Date : 20.08.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	: Sri Yoganand B M Contractor Bangalore
NAME OF THE WORK	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	20.08.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	470
3. Weight of Asphalt and Mineral matter Extracted, g	30	30
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30	30
7. Bitumen content in %	6.00	6.00
8. Average	6.00	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	13.8	13.8	2.9	97.1	90 - 100
9.5	65.8	79.6	16.9	83.1	70 - 88
4.75	90.3	169.9	36.1	63.9	53 - 71
2.36	46.2	216.1	46.0	54.0	42 - 58
1.18	35.8	251.9	53.6	46.4	34 - 48
0.600	55.3	307.2	65.4	34.6	26 - 38
0.300	42.8	350	74.5	25.5	18 - 28
0.150	34.9	384.9	81.9	18.1	12 - 20
0.075	42.8	427.7	91.0	9.0	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.9	14.9	3.2	96.8	90 - 100
9.5	66.2	81.1	17.3	82.7	70 - 88
4.75	92.8	173.9	37.0	63.0	53 - 71
2.36	45.3	219.2	46.6	53.4	42 - 58
1.18	48.2	267.4	56.9	43.1	34 - 48
0.600	56.3	323.7	68.9	31.1	26 - 38
0.300	45.8	369.5	78.6	21.4	18 - 28
0.150	37.9	407.4	86.7	13.3	12 - 20
0.075	32.6	440	93.6	6.4	4 - 10

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Assistant Executive Engineer
T Dasarahalli Sub Division
Bagalagunte, BBMP
Bangalore-560073.

Authorised Signatory

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
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CIVIL AIM CONSULTANTS & ENGINEERS

(Building Geo-Tech & Highway Materials Testing Laboratory)

An ISO 9001-2015 Certified Company

NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date : 20.08.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	: Sri Yoganand B M Contractor Bangalore
NAME OF THE WORK	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	20.08.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	469.5
3. Weight of Asphalt and Mineral matter Extracted, g	30	30.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30	30.5
7. Bitumen content in %	6.00	6.10
8. Average	6.05	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	12.2	12.2	2.6	97.4	90 - 100
9.5	68.9	81.1	17.3	82.7	70 - 88
4.75	92.6	173.7	37.0	63.0	53 - 71
2.36	42.5	216.2	46.0	54.0	42 - 58
1.18	36.8	253	53.8	46.2	34 - 48
0.600	50.9	303.9	64.7	35.3	26 - 38
0.300	46.3	350.2	74.5	25.5	18 - 28
0.150	35.8	386	82.1	17.9	12 - 20
0.075	46.9	432.9	92.1	7.9	4 - 10

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.5	14.5	3.1	96.9	90 - 100
9.5	62.8	77.3	16.5	83.5	70 - 88
4.75	90.9	168.2	35.8	64.2	53 - 71
2.36	46.5	214.7	45.7	54.3	42 - 58
1.18	43.8	258.5	55.1	44.9	34 - 48
0.600	52.4	310.9	66.2	33.8	26 - 38
0.300	49.3	360.2	76.7	23.3	18 - 28
0.150	35.6	395.8	84.3	15.7	12 - 20
0.075	40.8	436.6	93.0	7.0	4 - 10

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory.
- The results indicated above are based on the tests carried out on the samples collected at the site.
- Any Query regarding the report must be reported within 30 days from the date of testing.

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Job No.: CACE/BBMP/YBM/W No.15/2022-23 Date : 22.08.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	: Sri Yoganand B M Contractor Bangalore
NAME OF THE WORK	: Dismantling and Construction of Culverts,Removal of Debries and Providing new Pre-cast RCC Covering Slabs,desiliting of drains in Dasarahalli Ward No 15
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	22.08.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	469
3. Weight of Asphalt and Mineral matter Extracted, g	30	31
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30	31
7. Bitumen content in %	6.00	6.20
8. Average	6.10	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	13.9	13.9	3.0	97.0	90 - 100
9.5	65.6	79.5	16.9	83.1	70 - 88
4.75	90.5	170	36.2	63.8	53 - 71
2.36	46.5	216.5	46.1	53.9	42 - 58
1.18	36	252.5	53.7	46.3	34 - 48
0.600	55.9	308.4	65.6	34.4	26 - 38
0.300	43	351.4	74.8	25.2	18 - 28
0.150	35.1	386.5	82.2	17.8	12 - 20
0.075	43.1	429.6	91.4	8.6	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	15.1	15.1	3.2	96.8	90 - 100
9.5	66	81.1	17.3	82.7	70 - 88
4.75	92.6	173.7	37.0	63.0	53 - 71
2.36	45.1	218.8	46.7	53.3	42 - 58
1.18	48.1	266.9	56.9	43.1	34 - 48
0.600	56.1	323	68.9	31.1	26 - 38
0.300	45.6	368.6	78.6	21.4	18 - 28
0.150	38.5	407.1	86.8	13.2	12 - 20
0.075	31.6	438.7	93.5	6.5	4 - 10

Note:

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22.08.22

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